COLONY OF MAURITIUS.

IMPERIAL BUREAU OF MYCOLOGY 26 JAN. 1922

# ANNUAL REPORT

ON THE

# DEPARTMENT OF AGRICULTURE

## FOR 1914.

No. 1441.

THE HONOURABLE

THE COLONIAL SECRETARY,

I have the honour to submit herewith a report on Agriculture in Mauritius during 1914 and upon the work of the Department of Agriculture for the same year.

## SECTION I.

### AGRICULTURE IN MAURITIUS.

2. Agricultural industries were flourishing during the year. A series of abundant years for sugar-cane with satisfactory prices has improved the financial condition of all agricultural undertakings in the Colony. There has been a decided extension of the area cultivated under canes, and improvements are being made in all sugar factories. The fibre industry has improved by reason of satisfactory prices and other minor crops have found a ready market.

3. The year 1914 will long be remembered in the agricultural annals of the Colony by reason of the record crop of sugar and the abnormally high prices realised on account of the great war in Europe. The increase in monetary value of the sugar crop by nearly Rs. 30,000,000 will place this industry upon a very strong financial basis and large improvements in machinery may be looked for.

### *Climate.*

4. The year was characterised by climatic conditions which were exceptionally favourable for plant growth. During the cyclone season the Island experienced no severe winds. The rainfall was below normal ; but distribution of falls was regular. The summer rains at the end of 1913 were late, except in the northern districts ; but in January 1914, rain was general throughout the Colony and considerably above normal in the upper districts. From January until June the rainfall was below normal, but the falls were well distributed—the number of days on which rain fell being above normal. The air temperature throughout these months was above normal in all districts (except in Savanne during the month of May) and the amount of bright sunshine was relatively low. Such conditions were very favourable for plant growth and the whole Island at the end of June (with the exception of the lower part of Flacq where the beginning of the summer rains was late) was covered with luxuriant growth. In July the weather conditions continued to be favourable except in the Moka district where the rainfall was below normal. Thence onwards to the end of the year, rainfall was short, bright sunshine above normal and temperature, except during October, decidedly high.

5. The following table indicates briefly the climatic conditions that prevailed during the sugar-cane crop season of 1914 :—

| *Months.* | *Temperatures.* | *Rainfall.* | *Sunshine conditions.* |
|---|---|---|---|
| November 1913 | High ... ... | Short | Dull weather. |
| December „ | High (the minima being much above normal) | Short (except in northern districts) | Normal. |
| January 1914 | High, except in upper districts | Well distributed : above average in upper districts. | Dull. |
| February „ | High „ „ | Below average but regular in distribution | Normal. |
| March „ | High ... ... | Heavy in Savanne... | Dull. |
| April „ | High ... ... | Short ... ... | Normal. |
| May „ | High, except in Savanne | Normal ... ... | Dull. |
| June „ | High ... ... | Above average ... | Normal. |
| July „ | High ... .. | „ „ except in Moka | Dull. |
| August „ | Minimum temperatures high, except in northern districts | Below average ... | Normal. |
| September „ | High | Below average ... | High. |
| October „ | Low | „ „ ... | Normal. |
| November „ | High, except in upper districts | Short ... ... | High. |
| December „ | High | Short ... ... | High. |

6. The growth of sugar-cane was most satisfactory throughout the year. In March and April there appeared to be signs of fungus diseases in the Moka district; but the outbreaks were promptly dealt with and the weather conditions of May were not favourable to their spread. Canes matured irregularly except in some parts of the northern districts and juices were on the whole of low sucrose content and purity. The canes of the Moka district were of exceptionally low purity throughout the whole crop ; but canes in the northern districts and in the lower part of Plaines Wilhems, however, reached a high sucrose content towards the end of the crop.

7. The season was a favourable one for maize, pistache and other food crops ; while the comparative dryness of the winter months with an almost entire absence of fine rains resulted in freedom of the potato and tomato crops from leaf diseases.

## *Sugar-cane.*

8. On December 31st., 1913, 153,416 arpents were under sugar-cane cultivation. Of this, 92,514 arpents were cultivated by estates and 60,902 by planters. The total area of land cultivated in sugar-cane by Indians was 54,887.5 arpents or 35.77 % of the total area under this product.

9. During 1914, some further lands were brought under sugar-cane cultivation in the Pamplemousses, Rivière du Rempart and Black River districts. Five estates, viz : Plaisance, Belle Vue-Maurel, Belvédère, Pieter Both and Union-Chamouny were morcelled during the year—in four instances land being sold in comparatively small lots and in the other case in large blocks.

10. The White Tanna cane suffered during the year from Red-rot in the Moka district to a slight extent and it is possible that the resistance of that magnificent variety to this disease is declining. Throughout the Colony, with the exception of

the upper part of Savanne, a stem deterioration was detected in this variety (as also in Striped Tanna and Fotiogo canes) during crop. It is possible that this deterioration may have been caused in part by unfavourable climatic conditions during the period of ripening. The poor juices remarked in this variety in some districts may likewise, to some extent, be the result of the destruction by bacteria of sugar-containing tissues. The appearance of degeneration in the White Tanna variety during 1914 has resulted in managers of estates making a large percentage of their plantations with other varieties. There is no doubt as to the wisdom of this policy particularly in Moka where the White Tanna variety is almost solely cultivated. Perromat seedling 131 has been largely planted in this district and an extended trial of a striped sport of White Tanna has given very satisfactory results upon one estate. This sport is now being grown on a fairly large scale at the Central Experiment Station at Réduit and appears to be more vigorous and more rustic than the White Tanna.

Striped Tanna gave good results in the wetter districts, particularly in certain parts of Savanne.

The ratoons of the Iscambine variety growing upon the highest land of the central plateau gave high returns, and justify the cultivation of this old variety upon these lands.

Perromat seedling 55 has again done well in Flacq, Grand Port and the lower part of Plaines Wilhems, but in some places its growth has not come up to expectations.

D 74 gave some disappointing results in certain localities in ratoons. The canes were small and did not weigh satisfactorily. The juice of this cane is rich and of high purity. The variety appears to be well suited for *petite saison* and for cultivation in the lower part of the Plaines Wilhems District. On the higher lands, it has not proved to be satisfactory.

D 130 gave good results upon the littoral. This cane has a rich juice and appears to be well suited to the hot dry lands of the coastal regions. It not unfrequently gives high field yields.

D 625 has given good results during the year in certain parts of Mapou where the area under this variety is increasing. The juices of this variety were this year exceptionally rich and of high purity.

Estates continue to discard Perromat seedlings 87 and 89 and seedling 33 on account of their poor fuel value. They now plant these varieties only upon a small scale, but on account of their good field yields, these canes remain favourites with planters in certain localities.

Seedling 30 has given good results in the northern districts and there has been an extension in planting this variety. Other varieties that are being tried over a larger area in the northern districts are 15 and 29 of the 1904 series.

Uba gave good results on several estates upon lands of low fertility. This variety costs little to cultivate on account of its vigorous and hardy growth, but is difficult of manipulation in the factory.

11. There has been an extension of the experimental nurseries upon estates for varietal tests during the year and several estates have made new ones. The importance of testing varieties in the different localities of the Colony is recognised, as the climatic and soil conditions are so variable. The dependence of some estates solely upon the White Tanna variety is acknowledged as an economic weakness and therefore it is of the utmost importance that estates should distribute their risks by testing new varieties with a view to cultivating those kinds suited to their conditions.

Experiments in the partial sterilisation of cane soils with lime have been commenced upon one estate.

12. During 1913, considerable improvements in the machinery of sugar factories took place. Ten new boilers were installed and economisers were increased by 2, while two " sécheries " or bagasse driers were dispensed with. Two additional rollers were added to milling plants and three crushers put up. Defecators were increased by 44, settling tanks reduced by 31, and filter presses increased by 14. Slight changes were made in the evaporating plants. Vacuum pans were increased by 9, and 103 new crystalizers-in-motion installed. 35 Centrifugals of the Weston type were added.

13. For the 1914 crop, as for the previous year, 59 factories worked. There were comparatively small changes made in machinery for the 1914 crop. Furnaces

were improved at some factories and there is evidence that improvements are being made in this department of the factories as rapidly as possible. There were several estates which burnt no fuel other than bagasse during the year. The triple circulation type of furnace with the long combustion chamber and automatic feed is giving satisfactory results, and there are signs that great improvements will be made in furnaces for the 1915 crop as several estates have undertaken to remodel completely their furnace departments.

14. An impression of the average fuel consumption in the Colony per ton of cane is obtained from figures available from the annual control sheets published by the Society of Chemists :—

| | *Lowest consumption.* Calculated as coal—(kilos). | | *Average consumption 18 factories.* Calculated as coal—(kilos). | |
|---|---|---|---|---|
| | *Bagasse.* | *Additional.* | *Bagasse.* | *Additional.* |
| 1912 | 60.0 | 1.59 | 78.6 | 19.2 |
| 1913 | 62.8 | nil. | 60.1 | 17.0 |

15. A mechanical unloader was tried at one estate during the year; but difficulties were experienced with the feed in the "slicer" used before the first mill. It is anticipated that the slicer will be replaced by a crusher.

16. Some minor alterations were made in the milling plants and one combined crusher and first mill plant was installed. The Messchaert juice grooves were put in the second and third mills of one factory in the Colony towards the end of the crop and gave results which would appear to warrant a further extension of the system. The use of juice grooves upon rollers appears to be considered advisable.

17. Closer attention has been given to the application of water of imbibition, but there still appears to be a necessity for closer enquiry into the methods used. Steaming of the bagasse was practised in one factory for the 1914 crop and gave satisfactory results.

18. Some alterations were made in the clarifying and evaporating departments, but it is generally recognised that throughout the Mauritian factories there is a weakness in vacuum pans. The smaller pans are being dispensed with or enlarged, and some additional large pans are being put in.

19. Crystallisers-in-motion are being increased in number. The number of marks of sugar turned out by some factories is very large. Estate chemists should endeavour to effect a reduction in this number of marks, as economy in handling for shipment would be effected and the position of the industry would be strengthened by the production of definite standard grades of white sugar in the same way as is now being done in Java. It appears that this is rendered possible by a very close control of massecuites. Several questions relating to the size of crystallisers and to matters concerning crystallisation-in-motion received attention by estate chemists during the year and upon one estate temperature records were kept during the crop and are of considerable interest and importance.

20. There are now 8 suction gas-plants erected in sugar factories. They are mainly used for driving crystallisers and centrifugals, and their use effects economies in these departments. They have given general satisfaction and the cost of working up second products has been reduced by their installation. The charcoal producers are used, and the average fuel consumption is 1-1¾ lb. per B.H.P. Hour, according to the quality of the charcoal. An installation for irrigation purposes of a suction gas-plant with a wood-refuse producer has been very satisfactory, and there is now a tendency throughout the Colony to favour this type of producer, as its fuel consumption is less costly and difficulties are sometimes caused with charcoal plants by the tar products and dust of the local charcoal.

21. Three locally improved sugar elevators were installed during the year and gave satisfactory results with less breakage of grain.

22. The average extractions of factories sending in figures to the Society of Chemists have been as follows :—

| | | *Highest recorded.* | | *Lowest recorded.* | | *Mean.* | | |
|---|---|---|---|---|---|---|---|---|
| 1910. | Sugar o/o Canes | 12.26 | ... | 10.25 | ... | 10.84 o/o... | 23 | Factories |
| „ | „ o/o Sugar in Juice | 90.00 | ... | 84.99 | ... | 87.3 ... | „ | „ |
| 1911. | „ o/o Canes | 11.82 | ... | 9.70 | ... | 10.84 ... | 18 | „ |
| „ | „ o/o Sugar in Juice | 90.00 | ... | 85.10 | ... | 87.3 ... | „ | „ |
| 1912. | Sugar o/o Canes | 11.57 | ... | 9.78 | ... | 10.54 ... | 29 | „ |
| „ | „ o/o Sugar in Juice | 89.70 | ... | 83.30 | ... | 86.8 ... | „ | „ |
| 1913. | Sugar o/o Canes | 12.24 | ... | 10.20 | ... | 10.95 ... | 25 | „ |
| „ | „ o/o Sugar in Juice | 89.60 | ... | 84.60 | ... | 87.6 ... | „ | „ |

23. The average extraction for 1914 was below that for the previous years. During the greater part of the crop the juices were poor in sucrose and low in purity. The estates on the littoral and the lower part of Plaines Wilhems made good extractions, but the estates on the upper plateaux had very poor juices to manipulate.

24. Clarifying agents received some attention during the year. Phosphogelose was tried upon one estate, Albuslite gave very satisfactory results on others, while Phosphate of soda was generally appreciated upon the two estates on which it was tried as it facilitated clarification and reduced incrustation. These agents have been the subject of some investigation by the Chemical Division of the Department and reference to Annexure II should be made for details.

25. The total crop for 1914 is estimated as follows :—

| | *Estimated.* | | *Above average of 3 previous crops.* |
|---|---|---|---|
| Pamplemousses ... | 30,676 Tons | ... | 32.5 o/o |
| Rivière du Rempart | 35,435 | ... | 41.4 |
| Flacq ... ... | 43,720 | ... | 19.2 |
| Moka ... ... | 41,716 | ... | 34.5 |
| Plaines Wilhems ... | 21,185 | ... | 50.0 |
| Black River ... | 6,610 | ... | 48.1 |
| Savanne ... .. | 46,949 | ... | 27.5 |
| Grand Port... ... | 50,876 | ... | 28.8 |
| Total ... | 277,167 | Mean ... | 31.5 |

This is a record crop for the Colony, and most factories had to work 24 hours per diem to effect its completion. But few accidents occurred to machinery during the crop.

26. Shortage of Sulphur was experienced by some estates owing to the stoppage of supplies and some difficulties were experienced in supplies of bags.

27. The prices realised were high owing to the great war in Europe. The Imperial Government bought 129,000 tons of white sugar from Mauritian planters and 35,000 tons from the three English companies operating in the Colony. This purchase greatly facilitated the sale of the crop as, if it had not taken place, difficulties in finance and transport might have resulted. The sugar producers of the Colony gave to His Majesty's Military and Naval Forces 1,000 tons of white sugar, and several gifts of sugar were made to the forces of France.

28. The proportion of vesou sugar manufactured is increasing year by year and it is estimated that 84 o/o of the total sugars produced during 1914 were white crystal sugars.

29. Small planters received high prices for their canes. There was an increased demand by the planters for payment in sugar, and factories were more

disposed to meet this demand. Planters received prices averaging from Rs. 11 to Rs. 15 per ton of canes or sugar at the rate of 60 to 66 o/o of the extraction. In some instances, lessees of lands from estates were paid at lower rates. The relationships between estates and the planters were generally cordial, but canes were in some instances transported considerable distances by rail. The losses that result in grinding canes which are cut some days before crushing are not inconsiderable and some estate chemists have during the year made investigations into this subject.

30. In view of the reduction in areas of lands owned by factories, systems of payment for planters' canes are worthy of close investigation by factory owners. There is a tendency throughout the cane-sugar world to separate the manufacturing side of the industry from the agricultural side, and such a separation is gaining ground in this Colony. With this separation, definite systems of payments for planters' canes have to be decided upon and it would appear desirable that factory owners and planters should consider the possibility of adopting a sliding scale for payment for canes based upon the market price of sugar, the extraction of the mills and the quality of the canes. Such a scale would not be difficult to establish and would tend to consolidate the various units of the industry.

31. Implements were used in the cultivation of 18,600 arpents at the end of 1913. During the year 1914, the area under implemental tillage was extended, and the use of the fork more widely adopted. There are some estates in the Colony that now do the greater part of their cultivation with implements, and the following costs of different operations illustrate the economies effected :—

| | | |
|---|---|---|
| Burying trash ... ... ... | Rs. 8-11 | per arpent |
| Opening furrows for planting ... | 4-6 | „ „ |
| Burying Guano ... ... ... | 2-2.50 | „ „ |
| Subsoiling ... ... ... ... | 2-2.50 | „ „ |

32. A large area of canes were planted in rows made by double-mould board ploughs during the year. Covering of manures, weeding and cultivation are likewis commonly practised upon several estates with most satisfactory results. The steam plough tackle of the Mauritius Assets Company again cultivated a small area upon estates belonging to that Company, and the cost of thoroughly preparing land for planting approximates Rs. 45.

Work done with disc ploughs has diminished somewhat during the year, and managers report that these ploughs turn up a certain amount of subsoil and the crop planted after ploughing has not in some instances grown as satisfactorily as was expected. The double-mould board ploughs are generally favourites and the use of subsoil ploughs is extending, as the results after their use have proved most satisfactory.

33. The rainfall being regularly distributed throughout the year, several estates which commonly irrigate did not do so for the crop of 1914. There was, however, a shortage of water in the rivers at the end of the year and some factories had difficulties through want of water towards the close of their crops. Upon several estates irrigation for the 1915 crop was rendered impossible by this shortage of water.

## *Fibre.*

34. The prices for aloe fibre ruled satisfactorily until the outbreak of war, when the market for Mauritius fibre completely closed. The fibre market for this Colony is Hamburg and with the outbreak of war this market was cut off. For several months only two fibre factories worked and one of these was engaged upon a special contract for Spain. Gradually, however, the English market began to make enquiries for Mauritius fibre, and at the end of the year several factories had begun operations with fibre at Rs. 260—270 per ton for prime. The use of suction gas-plants in aloe factories is becoming general where water-power is not utilised. Considerable economies in fuel are effected thereby. At the end of 1913, there were 4 suction gas-plants driving fibre machinery, while at the end of 1914, there were 11 factories fitted with these plants.

The Government received a No. 2 New Corona Decorticating Machine during the year and steps have been taken for its erection with a suction gas-plant for power in a central position in the Black River district.

## *Tea.*

35. Good crops of tea were obtained during 1914, and a reduction of the local price had to be made in order that too great a stock should not be carried over. Plans have been made for conducting experiments with manures and leguminous crops in tea cultivations and enquiries have been made during the year with a view to finding an outlet for Mauritius teas.

## *Cocoa-nuts.*

36. The terms of cocoa-nut leases upon Pas Géométriques were amended during the year. Plants recently put out on portions of these lands grew satisfactorily and did not appear to suffer to any great extent during the extremely dry period at the end of the year. There was but a small extension of areas put under cocoa-nuts during the year.

## *Cacao.*

37. Cacao again did well in Grand Port and increases in this cultivation could be made in selected parts of this district. The grade of cacao grown is a good one ; but improvements in curing are still desirable.

## *Coffee.*

38. There would appear to be a prospect of increased areas of coffee being grown in the Colony. The Liberian variety grows well and yields satisfactory crops while trials with the robusta variety are being made. A plantation of creole coffee suffering from leaf disease greatly improved after systematic spraying with Bordeaux mixture. If the control of this disease could be assured, further plantings of this variety would be made. The cultivation methods for coffee are in need of improvement.

## *Maize.*

39. The area under maize cultivation was estimated to be 3,000 arpents. The main crop in April and May was a large one and prices were low ; but the second crop of October-November failed on account of drought, except in a few favoured localities. Inquiries have been made from the Department as to the storage and disinfection of maize and it is expected that one or two co-operative experimental trials will be made during the coming crop. An extension of the use of maize in feeding stock could be made.

## *Vanilla.*

40. The vanilla crop was an average one and prices were fairly satisfactory until the outbreak of war in August. The vanilla market was thereby closed until the end of the year and only a few local sales took place.

## *Pistache.*

41. The area cultivated under this crop increased during the year, and some satisfactory yields were obtained. An increased proportion of the crop was used for oil-crushing and ground-nut meal was in demand by some estates for feeding stock. The experiments conducted by this Department with varieties of pistache have demonstrated that crops grown in the Colony repay for careful cultivation.

## *Manioc, Potatos, &c.*

42. Manioc cultivation decreased somewhat during the year, but yields were better than during 1913. Potatos yielded satisfactorily and were, on the whole, free from serious fungus diseases. Tomatos grew well and the supplies of vegetables were satisfactory except during the dry months of October to December. The crop of cauliflowers was exceptionally fine.

## *Fruit.*

43. The mango crop was a good one and letchis did well. There was a shortage of citrus fruits on the markets, and an increase in culture of these plants upon suitable lands is desirable.

## *Stock.*

44. The value of cattle for plough purposes increases and the import prices for Madagascar animals were higher than previously. There was a good demand for local creole cattle at enhanced prices, and breeders are paying closer attention to selection of breeding animals. Three Madagascar bulls were obtained by the Department, and other stock for stud purposes has been ordered from India. Three sugar estates are availing themselves of this opportunity of introducing new stock from India in order to improve the standard of their draught animals, and one has during the year made a special breeding ground upon Ile-aux-Cerfs for selected animals. The cows have all been tested with tuberculin and the bulls from India are expected early in 1915. Interest is being taken in the control of ticks upon cattle by dipping. One estate has erected a dipping tank with satisfactory results and others are contemplating further installations.

## *Irrigation.*

45. In February 1914, the preliminary report of Mr. G. M. Harriott, C.S.I., C.I.E., Consulting Engineer for Irrigation, was presented to the Council of Government when it was decided to proceed with a part of the plans therein indicated. Such a step is an important one in the annals of the agriculutre of the Colony, and it is expected that irrigation will be provided for at least 3,000 arpents of land. Several details respecting agricultural practice and agricultural statistics have been furnished by the Department to Mr. Harriott during the year.

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# SECTION II.

## WORK OF DEPARTMENT OF AGRICULTURE, 1914.

46. The outline scheme drawn up in 1913 for the work of the Department has been systematically worked through and progress appears to have been made.

## *Equipment.*

47. The buildings have been fully equipped to meet the needs of the Laboratories of the Chemical, Entomological, and Botanical Divisions of the Department. Researches in all these branches have been begun, and requests for information from agriculturists have increased in number during the year. The petrol gas-plants installed during the year have given satisfaction.

## *Divisional Reports.*

48. The work of the Division of Phytopathology is given in Annexure I. Investigations into diseases of canes demanded considerable attention, but no epidemics of a serious nature occurred. Red-rot disease of sugar-cane increased slightly during the year and will have to be carefully watched. The success of the spraying experiments against coffee-leaf disease is encouraging and the value of auto-sprays for work in tropical plantations was demonstrated. An examination into the "sludge" of fascine waters was begun.

49. Annexure II gives details of the work of the Division of Chemistry. Work of importance to the sugar industry undertaken by this Division includes inquiries into the action and value of clarifying agents in sugar manufacture, analyses of boiler-feed waters and investigations into the use of waste waters from factories for irrigation purposes. The routine analyses of manures, &c., were fewer than usual and advantage was taken of this to begin the soil survey of the Colony and to make laboratory investigations into the action of molasses upon Mauritius soils. The latter investigations indicate that a possible increase in the available mineral salts takes place after applications of molasses and the results of further field trials are

awaited with interest. An examination into the composition of the milks of the Colony has been begun. The fortnightly chemical control amongst sugar estates during crop has proved to be of interest and 32 factories contributed to the sheets during the 1914 crop.

50. The work of the Entomological Division is given in Annexure III. Careful investigations have been made into the life-history of *Sesamia nonagrioides*—the pink borer of the sugar-cane—and the practical control of this pest by the employment of maize as a trap-crop demonstrated. The control measures adopted against *Phytalus Smithi* have occupied a large amount of the Entomologist's attention. Every effort has been made to make the organisation of control measures as effective as possible in co-operation with affected estates. The number of insects captured during the year was larger by 4,692,354 than during the previous year and in addition 6,694,300 larvæ were destroyed. Affected estates have assisted towards the control of the pest by employing special gangs upon their estates and providing funds for a special gang employed under the supervision of an employee of the Department. A further special gang has been provided by Government for the Royal Botanic Gardens, Pamplemousses, and authorised purchasers of insects have been selected to facilitate the collection of adults and to avoid their transport into non-infected areas. There are signs that the infected area has slightly increased during the year and more strenuous efforts will have to be made in order to control this pest until its parasite can be established. Affected estates will be called upon for further efforts, in order that the number of insects may be reduced.

51. A Veterinary Surgeon was appointed to the Department on October 30th and his work to the close of the year is shown in Annexure IV.

52. The work of the Statistician is shown in Annexure V. A complete census of live stock of the Colony was undertaken and careful inquiries made into systems of land tenure, in addition to the agricultural statistics for the Blue Book and those relating particularly to the sugar crops of the Colony.

53. Annexure VI details the work of the Division of Experiment Stations and Gardens. At the Central Experiment Station, Réduit, sugar-cane experiments have been continued and some seedlings of promise have been distributed for estate trial. Varietal tests have been made with maize and pistache and the rearing of stock (cattle, sheep, poultry) provided for. At Pamplemousses Experiment Station trials have been made with sugar-cane, maize, pistache, rice, manioc, sweet potatos, cotton, tobacco and other economics, while at Curepipe experiments with tea and camphor have been commenced.

54. Annexure VII records the proceedings of the Board of Agriculture.

## *Co-operative Experiments with Estates.*

55. Manurial experiments to test the value of the fertilising agents commonly employed in the mixed guanos for sugar-cane in the Colony have been begun upon 11 estates. Experiments to test the values of molasses and lime have also been instituted. On one estate, experiments to test the sterilising effect of heavy applications of lime have been laid out by the manager of the estate. Plans have been made for experiments with manures for tea, and plots have been selected.

## *Demonstration Plots for Small Planters.*

56. Demonstration Plots for small planters have been established at Petit Raffray, Triolet and Long Mountain. Further efforts in this direction had to be postponed until after the arrival of the Agricultural Instructor.

## *Examination of Plant Imports.*

57. Importations of plants have been regularly inspected by scientific officers of the Department at port of entry under the Plant Diseases and Pests Regulations Imports were examined on 20 occasions at the Central Post Office and on 55 occasions at the Customs during the year.

## *Publications.*

58. Regular departmental publications have been established as Bulletins issued in three series: General, Scientific and Statistical. The following Bulletins were prepared during the year:—

General Series 1. "*Hints as to forwarding Specimens for Examination*".
(This Bulletin gives information as to how specimens for analysis or examination by the scientific officers of the Department should be forwarded.)

2. "*Plant Diseases and Pests Regulations.*"
(This Bulletin gives a concise account of the plant diseases and pests Ordinances of the Colony and the several orders and regulations made thereunder).

3. "*Varietal Tests, 1914—Ground-Nuts, Maize and Rice.*"
(Varietal tests with these economic crops are recorded. It was demonstrated that large-seeded varieties of ground-nuts and white maize gave satisfactory yields in the Colony, and that some varieties of rice might be grown in some localities).

Scientific Series 1. "*Absorptive Powers of Soils of Mauritius.*"
(This constitutes a study made by the Assistant Chemist upon the absorptive powers of Mauritian soils for salts used as fertilisers. Most of these salts are readily fixed by the soils and the actual losses caused by heavy rains are not considerable. The disadvantages in the use of superphosphate have been remarked upon).

Statistical Series 1. "*Live Stock Statistics, 1914.*"
(This bulletin constitutes a complete study of the live stock of the Colony A census was taken in co-operation with the Sanitary Authorities during the early part of the year. A review of the figures obtained is given and details concerning meat, poultry and egg consumption discussed).

59. Regular reports were made semi-annually by the scientific divisions of the Department to the Board of Agriculture and statistical data relative to crop prospects and returns were worked up. In addition the following publications were prepared for the Board:—

(1) Report on Entomologist's Visit to South Africa.
(2) Average sale price and consumption of the Sugar-crop, 1913–14.
(3) The use of Potash Salts in manuring sugar-canes.
(4) Analyses and valuation of Animal Foodstuffs (completed, January 1915).

## *Legislation.*

60. The following Ordinances and Proclamations relating to the Department of Agriculture were passed during the year:—

Ordinance No. 7 of 1914—The Plant Diseases Prevention (Amendment) Ordinance.
„ 40 „ —The fees to Veterinary Surgeon (Amendment) Ordinance.

Proclamation No. 7 of 1914—To prohibit the Importation of Fowls and other Birds from Madagascar, Ceylon and African Ports.
„ 8 „ —To prohibit the Importation of Fowls and other Birds from Madagascar, Ceylon and Tropical African Ports, except by Government for scientific purposes.
„ 18 „ —To proclaim conditions under which cattle coming from Indian Ports shall be allowed to land in Mauritius.
„ 61 „ —Prohibiting the Importation of Animals, &c., into Rodrigues.

## *Educational.*

61. The scheme of teaching Nature Knowledge and Manual Training formulated in co-operation with the Director of Public Instruction has been adopted and the establishment of School Gardens for all rural primary schools is now under consideration.

62. Arrangements have been made at Curepipe Gardens for the establishment of definite sections for educational purposes.

63. Five persons sat for the entrance examination of the School of Agriculture established by the Department, and three were selected for training, making the total number of students up to five. Regular lectures have been given in Agriculture, Agricultural Botany, Agricultural Chemistry, and Agricultural Entomology throughout the year except during crop time. Three students had experience in practical sugar factory control during the crop. The syllabus is working satisfactorily and the students are receiving a good general training in the sciences of Agriculture.

64. Mr. J. F. Clarenc, B.S., who was awarded a scholarship out of the Station Agronomique Funds to visit Porto-Rico, Cuba, Louisiana and Java, returned to the Colony in July 1914, and submitted reports upon the manufacture of sugar in those countries.

## *Expenditure.*

65. The expenditure of the Department has been as follows :—

| | | |
|---|---|---|
| Salaries ... ... ... ... ... | Rs. | 38,107.66 |
| Maintenance of Gardens ... ... ... | | 13,636.38 |
| „ „ Apprentices ... ... ... | | 382.37 |
| General Services ... ... ... ... | | 16,127.31 |
| Prevention of Plant Diseases ... ... ... | | 14,981.23 |
| „ „ Animal „ ... ... ... | | 750.92 |
| Upkeep of Stock ... ... ... ... | | 1,317.73 |
| Establishment of Demonstration Plots... ... | | 387.40 |
| Travelling Expenses ... ... ... ... | | 2,432.24 |
| Special Importation of Stock ... ... ... | | 994.89 |
| „ Fibre Decorticating Machine ... ... | | 6,523.94 |
| Total ... | Rs. | 95,642.07 |

## *Receipts.*

66. The receipts have been as follows :—

| | | |
|---|---|---|
| Rent of Tea Plantation ... ... ... ... | Rs. | 1,165.31 |
| Analytical Fees ... ... ... ... ... | | 542.00 |
| Veterinary Fees at Customs ... ... ... | | 316.00 |
| Sale of Canes ... ... ... ... ... | | 3,836.03 |
| Sale of Plants, Flowers, &c., ... ... ... | | 388.87 |
| Sale of Eggs ... ... ... ... ... | | 238.00 |
| Students' Fees ... ... ... ... ... | | 90.00 |
| Total ... | Rs. | 6,576.21 |

## *Staff Changes & Leaves of Absences.*

67. Mr. P. Bonâme (Ing. Agr.) retired from the position of Assistant Director and Chemist, after three months leave of absence, on August 10th. Mr. Bonâme as Director of the Station Agronomique from 1892 to 1913 had acquired a unique knowledge of the agriculture of the Colony and his services on the staff of the Department during its period of organization were of great value and assistance. He was replaced by Mr. G. G. Auchinleck, B.Sc., F.C.S., who arrived in the Colony on the 22nd. September 1914.

68. The Entomologist was on duty leave in South Africa from January 1st. to March 2nd.

69. Mr. F. E. Lionnet (Ec. Nat. Vet., Alfort,) arrived in the Colony from Egypt on the 30th. October to assume duties as Veterinary Surgeon upon the staff of the Department.

70. Mr. R. Toureau, Assistant Clerk, was on leave of absence from June 1st. to November 30th., and was replaced by Mr. M. Pierrot.

71. Mr. F. Leclerc was confirmed in his appointment of Overseer, Curepipe Experiment Station and Botanic Gardens, with effect from the 5th. September, 1913.

72. Extra clerical assistance being necessary in the Department, Mr. M. Pierrot was appointed as Writer from the 12th. December, 1914.

73. Mr. H. Motet, Officer-in-charge of Beetle Destruction, resigned on December 27th.

74. Throughout the year a large amount of work has been demanded of the whole of the Staff of the Department. Additional work is always necessary on the part of all during the period of organization of any Department and I desire to record my appreciation of the efforts made by all members of the staff to meet the demands required of them during the year. I have reason to believe that these efforts have been appreciated by the Agricultural Community of the Colony.

I have, &c.,

F. A. STOCKDALE,

Director of Agriculture.

February 26th., 1915.

*ANNEXURE I.*

REPORT ON THE WORK OF DIVISION OF

# PHYTOPATHOLOGY

FOR THE YEAR 1914.

The laboratory was equipped during the year and a series of investigations were made into diseases of economic importance. The Public Works Department was unable to erect the green-house culture room for this division during the year, but steps have been taken to put its construction in hand at an early date in order that the work of this division may be facilitated. Samples sent in for investigation were numerous in the months of April and May and again in October. Twenty-two reports were made to agriculturists upon specimens submitted for examination, and half-yearly progress reports were made for the Board of Agriculture. These progress reports have been printed and circulated throughout the Colony for general information.

## GENERAL CONDITIONS AMONGST ECONOMIC CROPS.

The general climatic conditions throughout the year were not on the whole favourable to the spread of fungus diseases, although it appeared possible in April and May that an outbreak of red-rot disease upon sugar-cane might take place. Diseased specimens were forwarded from several estates and field investigations were made. All suggested remedial measures were promptly carried out by estate-managers and in no instance did the disease spread beyond its initial limits. Later in the year, a deterioration in White Tanna and other varieties caused some anxiety. This occurred in both virgins and ratoons, and was to be found, to a greater or less degree of intensity, in all districts of the Colony, except the upper part of Savanne. A bacterium has been isolated which may be responsible for the deterioration reported; but climatic factors of the ripening period undoubtedly played an important part. This deterioration was most marked in Moka and Grand Port districts, and in both these districts cane ripened abnormally quickly, during the hot, dry months of September and October. In the drier localities of the northern districts, some root disease of sugar-cane was investigated and it is probable that some of the irregularities of yields not unfrequently reported from this district may have been caused by this disease. The effects of this disease were noticeable in some parts in the month of April; but were less noticeable after the favourable growing weather of June and July.

The manioc disease (caused by *Gleosporium* sp.) was much less noticeable during the year and much less leaf disease (*Phytophthora infestans*) of potatos and tomatos occurred than during 1913.

## INVESTIGATIONS.

The following diseases were under investigation during the year :—

### *Sugar-cane.*

(1) Root-disease—caused by a species of *Marasmius* and not uncommon in some fields of estates in the north of the Island. Heavy applications of lime are being experimented with for the control of this disease.

(2) Red-rot—caused by *Colletotrichum falcatum*. Occurred between March 15th. and May 15th. in the Moka district, in fields that had been trashed during the month of March. All diseased canes were cut out and burned, and the spread of the disease was checked. Striped Tanna canes affected by this disease were also sent in for examination in October and November from an estate in Grand Port. All diseased canes were carefully collected and burned.

(3) Rind disease—a rind disease probably caused by *Melanconium sacchari* was observed upon an estate in Flacq in virgin canes. The area affected was not extensive and the disease was easily controlled.

(4) Gumming—this disease, common upon the Louzier variety and caused by *Bacillus vascullarum*, was investigated as it was thought that some examples of gumming had been observed upon the White Tanna cane. This affection on the White Tanna variety was not common.

(5) Top-rot— this disease is to be found in all districts; but does not occasion much damage except when climatic conditions are unfavourable. It is of bacterial origin.

(6) Deterioration during Ripening—a disorganisation of parenchymatous tissues between the water-conducting vessels of the stem and their supporting fibres received close attention in October and November. It was found in Striped Tanna, White Tanna and Fotiogo varieties, and was possibly responsible in some districts for poor juices. It was most common in those localities where climatic conditions most favourable to active, vigorous growth were followed by a spell of dry, hot weather. The canes matured very rapidly and this deterioration in stem tissues was observed when a check in the process of maturity occurred. A bacterium was isolated which may be responsible for this disorganisation of tissues. Planters state that a similar trouble has been noticed, on a small scale, in previous years, principally on canes that had passed maturity.

(7) Leaf diseases—several have been examined, but they are only of minor economic importance.

## *Coffee.*

(1) Leaf disease—of Arabian coffee caused by *Hemelia vastatrix* was very prevalent during April and May. It occasioned considerable damage amongst the creole coffee plants under cultivation in the Colony. Spraying with Bordeaux mixture gave good results.

(2) A Root-disease—caused by a Hymenomycetous fungus was examined amongst coffee growing in the Plaines Wilhems district. This has been controlled satisfactorily by applications of lime around affected trees.

## *Citrus plants.*

(1) Root-disease—caused by a Hymenomycete was investigated in the northern districts. It yielded satisfactorily to treatment with quicklime around the roots of affected plants.

(2) Gummosis has also been observed, more particularly on plants which have been manured heavily with organic nitrogenous manures.

## *Manioc.*

The stem disease caused by a species of *Gleosporium* was again investigated, but it was much less prevalent than during 1913.

## *Pistache.*

*Uredo arachis* causing a leaf disease was common in some localities and caused complete defoliation.

## *Potatos & Tomatos.*

(1) The Collar Rot of these plants caused by a species of *Fusarium* was again common. In some instances it was successfully controlled by means of applications of quicklime around the stems of the plants. It was again demonstrated this year that applications must be made at the first symptom of the disease, otherwise control is impossible.

(2) The Fruit Disease of tomatos caused by *Gleosporium phomoides* was common in some gardens.

## *Vanilla.*

The Anthracnose disease caused by *Calospora vanillæ* was again under investigation.

## *Junipers.*

The disease of Junipers at Kanaka forests, which is caused by *Pestalozzia Guepini* continues to spread and it appears to be probable that re-afforestation with junipers in this locality will have to be abandoned.

## FUNGICIDES.

(1) Spraying with Bordeaux mixture was undertaken systematically against coffee leaf disease upon a plantation in the Plaines Wilhems district. The spraying was not commenced until the disease had become prevalent—but the results were entirely satisfactory. From these experiments it would appear that it ought to be possible to cultivate the Arabian variety of coffee if spraying was made part of estate routine. The value of auto-spray machines under tropical conditions were demonstrated during these experiments.

(2) The value of quicklime as a fungicide has been demonstrated against root-diseases of citrus plants and of coffee. The lime must be of good quality, for slaked lime has little or no fungicidal value. Quicklime is also being employed against the root-diseases of sugar-canes.

F. A. STOCKDALE,

8th. February, 1915. Director of Agriculture,
Phytopathologist.

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*ANNEXURE II.*

REPORT ON THE WORK OF DIVISION OF

## CHEMISTRY

FOR THE YEAR 1914.

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During the year 1914, the following analyses were carried out in the chemical laboratory of the Department for agriculturists :—

| | Samples. | Dosages. |
|---|---|---|
| Manures | 53 | 188 |
| Cane-juices | 6 | 31 |
| Sugars and Molasses | 7 | 26 |
| Waters | 11 | 38 |
| Miscellaneous | 8 | 26 |
| | 85 | 309 |

The fees amounted to Rs. 542. The number of manures sent in for analysis was considerably less than in former years.

In addition, the following analyses, in connection with research and experimental work of the Department, were performed :—

| | Samples. | Dosages. |
|---|---|---|
| Cane-juices | 675 | 2,024 |
| Milk | 54 | 270 |
| Plants | 22 | 161 |
| Soils | 26 | 369 |
| | 777 | 2,824 |

### *Soils.*

In January, a series of determinations of soil moistures was begun, the soil from three fields, at depths of 4, 8 and 12 inches in each case being taken once a week,

with the idea of correlating the percentage of moisture with the rainfall. Up to September, when the series had to be abandoned, about 300 determinations had been made. The determinations will be continued with slight modifications in 1915.

A soil survey of the Island has been begun and 26 soils were examined during the year.

Laboratory investigations were undertaken by the Assistant Chemist into the action of molasses upon soils of the Colony. A series of experiments consisting of soils treated with varying proportions of molasses or with sucrose was started and the soils were analysed every fortnight in order to follow the soil changes taking place. Although it is possible that the experiments may have to be repeated, the results obtained indicate that an increase in available mineral elements take place in Mauritian soils after applications of molasses.

## *Irrigation Waters.*

Examinations have been made during the year of waste waters from sugar-factories used for irrigation purposes. Many of these waters are of high temperature and are heavily charged with waste matters from the factories. The relationship between the temperature and impurities of these waters and plant growth has been the subject of investigations.

## *Milks.*

Arrangements were made in October to carry out a series of analyses of milks of the Colony, and, from then to the end of the year, 54 samples were examined. The samples are to be drawn from all districts of the Colony in order that a representative collection may be obtained, and in each case the samples are taken in the presence of the estate's chemist.

## *Sugar-Factory Investigations.*

The effects of various clarifying agents, such as sodium phosphate, albuslite, phosphogelose, which are in use in local usines, upon cane-juices, have been to a certain extent studied this year. The analyses of the last two substances are :—

| | *Phosphogelose.* | *Albuslite.* | |
|---|---|---|---|
| | | 1. | 2. |
| Moisture ... ... .. ... | 5.04 | 14.77 | 23.75 |
| Phosphoric Acid (total) ... ... | 33.70 | 42.00 | 42.24 |
| „ „ free ... ... ... | ... | (33.45) | (36.21) |
| Lime ... ... ... ... | 26.76 | 4.26 | 3.32 |
| Organic Matter .. ... | 18.16 | nil | nil |
| Undetermined (silica, &c.,) ... ... | 16.34 | 38.97 | 30.69 |
| | 100.00 | 100.00 | 100.00 |

Analyses of defecated juices which received phosphate of soda were made and compared with samples of the same juice taken before treatment. Results were as follows :—

| | 1 *Before.* | 1 *After.* | 2 *Before.* | 2 *After.* |
|---|---|---|---|---|
| Density @ 15°C. ... ... | 1,065.25 | 1,064.25 | 1093. | 1,091. |
| Sucrose ... ... ... ... | 14.38 | 14.46 | 20.66 | 20.80 |
| Glucose ... ... ... ... | .67 | .70 | 1.08 | 1.17 |
| Ash .. ... ... ... | 6.08 | 4.84 | 6.28 | 6.64 |
| Dry Matter ... ... ... | 17.14 | 17.12 | 24.36 | 24.00 |
| Real Purity ... ... ... | 83.9 | 84.4 | 84.8 | 86.6 |

In both cases there is a slight increase in the real purity. The more detailed analyses of these juices are perhaps more interesting :—

| | 1 *Before.* | 1 *After.* | 2 *Before.* | 2 *After.* |
|---|---|---|---|---|
| | — | — | — | — |
| Silica ... ... ... ... | 1.364 | 1.188 | 1.637 | 2.114 |
| Lime ... ... ... ... | .838 | .554 | .719 | .550 |
| Magnesia ... ... ... ... | trace | trace | .227 | .260 |
| Potash ... ... ... ... | 2.010 | 1.512 | 1.378 | 1.273 |
| Soda ... ... ... ... | .162 | .295 | .192 | .311 |
| Sulphuric Acid ... ... ... | 1.024 | .825 | .853 | .720 |
| Phosphoric „ ... ... ... | trace | trace | .162 | .240 |
| Iron ... ... ... ... | ... | .. | .458 | .534 |
| Chlorine ... ... ... ... | ... | ... | .721 | .528 |
| Carbonic Acid, &c., ... ... | ... | ... | trace | .152 |

The assertion that the phosphoric acid acts by eliminating the excess of lime and thus permits better crystallization appears to be borne out by these figures ; the lime decreases considerably after treatment.

The Bi-mensual Mutual Control which was inaugurated in 1913 was continued in 1914, and 32 usines regularly submitted sheets during the crop for compilation by the Assistant Chemist. Confidential circulation amongst the contributing factories was regularly made.

## *Educational.*

Five students received regular lectures in agricultural chemistry during the year and four worked in the laboratory to gain practical experience. One student acted as Assistant Chemist at Riche-en-Eau during the crop, another acted as Chemist at Beau Séjour for 15 days and a third was attached to Mon Désert, St. Pierre, as a volunteer.

GILBERT AUCHINLECK,

8th. February, 1915. Assistant Director and Chemist.

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*ANNEXURE III.*

REPORT ON THE WORK OF DIVISION OF

# ENTOMOLOGY

FOR THE YEAR 1914.

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The Entomologist returned from South Africa on March 2nd. where he had been on duty leave. During this visit he investigated insect pests in South Africa and examined the several remedial measures practised there. A report on this visit was published and circulated to agriculturists.

## COLLECTIONS AND FIELD INSPECTIONS.

The collection of insects injurious to plants and affecting domestic animals together with their natural enemies was greatly increased in 1914.

Some time has been devoted to photographing insect pests and the plants attacked by them.

Visits were frequently paid to sugar estates and other places for various investigations, and advice given respecting the treatment of injurious insects.

## INVESTIGATIONS OF INSECT PESTS.

The following is a brief list of the principal insects which were under investigation during this year :—

### *Sugar-Cane.*

*Sesamia nonagrioides.*—Pink Borer.

As in previous years the virgin canes grown in damp localities have suffered from the attacks of this pest. It has received close attention and its life-history has been thoroughly investigated. The results of these investigations have been summed up in two reports laid before the Board of Agriculture.

Since their publication field experiments with control measures were continued in different localities. The planting of maize as a "trap" for the borers has given most satisfactory results.

A small hymenopteron fly (*Ceraphron beneficiens*) which had not previously been recorded in the Island was discovered parasiting the eggs. As these are very conspicuous and are easily removed from the maize plants, those which are parasited may be saved from destruction.

This preservation of the parasite will by increasing its numbers assist in the control of this borer.

*Diatræa striatalis.*—The spotted Borer.

On one occasion this species was reported as seriously attacking young virgin canes in the district of Moka. Elsewhere it is still limited to cane stalks.

In 1913–14 a number of sugar-canes (17,500) were examined during the crop for ascertaining the actual losses sustained by the planters through the attacks of this insect.

The following table shows the differences existing between the localities and the varieties of canes :—

| | Lowest percentage. | Highest percentage. | Mean infection. |
|---|---|---|---|
| Moka. | — | — | — |
| Seedlings | 7 | 40 | 21 |
| Tannas | 6 | 26 | 12.81 |
| Pamplemousses. | | | |
| Seedlings | 9.9 | 14.3 | 12.62 |
| Tannas | 13.5 | 13.5 | 13.4 |

*Argyroploce schistaceana.*—The white Borer.

This borer was noticed to be of more frequent occurrence than in previous years. It has at present spread all over the Island and is to be found in great numbers in certain localities. Its life-history has been worked up. More data have to be gathered before a practical means of control can be suggested.

*Lachnosterna* sp.

This grub was noticed at Riche Bois, associated with *Oryctes tarandus*, causing serious damage to full-grown sugar-canes. It was located, however, in a small area and has been kept under control.

### *Forest trees.*

Young plantations of mahogany trees grown at Mahebourg by the Forest Department were severely attacked by a Pyralid moth.

Illipe trees at "La Ferme" suffered much from a longicorn beetle (*Phelematium femorale*), and Bois noir (*Albizzia Lebek*) was again reported as having been badly affected by *Batocera rubus*.

## *Garden Pests.*

*Dacus ferruginea* and *Dacus* sp.—The Cucurbit Flies.

These two flies were very prevalent thoughout the year. Attempts to control them by spraying from time to time the plants with Arsenate of Lead and sugar did not seem to give any appreciable results.

*Crocidolomia binotalis*—the cabbage moth ;

*Porbe bjerkandrella*—the artichoke moth ;

*Ceratitis capitata*—the fruit fly ;

*Carpocapsa pomonella*—the Codling moth ;

*Adoretus versutus* ;

*Icerya Seychellarum*—the " pou blanc " ;

and many other pests were reported to this Division as causing much harm to vegetables, fruits and ornamental plants.

Good results were obtained by use of the insecticides recommended.

## *Insects attacking stored Grains.*

Investigations respecting these insects have been completed and a bulletin prepared for publication.

## *Insects attacking Leguminous crops.*

*Argyroploce rhyncias*—The Pois sabre Borer.

This insect was very prevalent in different localities causing in one instance the wholesale destruction of several fields. Its life-history has been worked out. It is possible that it may be controlled by handpicking of the eggs.

## *Insects attacking domestic Animals.*

*Sarcopsylla gallinacea.*—The poultry flea.

A poultry run was infected with this flea. Spraying with kerosene and Phenyl mixture at 1 o/o succeeded in controlling the pest.

*Ixodidæ.*—Ticks.

These parasites have been thoroughly investigated. Specimens were received from all parts of the Island.

Six species have been identified :—

*Amblyomma variegatum* on deer, cattle, goats ;

*Rhipicephalus sanguineus* on cattle, dogs ;

*Rh. evertsi* on cattle, dogs ;

*Margaropus annulatus* var. *decoloratus* on cattle ;

*Amblyomma* sp. on cattle ;

*Argas persicus* on fowls.

Three of them, viz :— *Rh. evertsi, Rh. sanguineus, M. annulatus* var. *decoloratus,* are the well-known carriers of dog and cattle piroplasmosis (jaundice and red water fever).

Ticks have been controlled (and almost eradicated) in South Africa by dipping the animals in arsenical solutions. The dipping tanks are constructed in concrete below the soil level and measured 40 feet long, 3–4 feet wide and 6–7 feet deep. At one end (the entrance) it is abruptly cut, whilst at the other end (the exit) there is a slight slope which allows of the easy exit of the animals. For avoiding rain water, the edges are bordered with a stone wall measuring about two feet high and the tank has a corrugated iron or straw roof.

One dipping tank has this year been constructed at St. Antoine estate at a cost of Rs. 200. The results have been most satisfactory. Ticks have decreased in numbers and the general condition of the cattle has improved.

## *Phytalus Smithi.*

A census of the infected area was made as usual in May. The results were communicated to estates within the infected area. It showed that the pest had not spread over a larger area. The infection was found to be less intense in certain

localities such as Canton de Nancy, and Camp des Ambrevades ; but was more severe in others, more especially in Maison Blanche where many young virgin fields suffered severely. The digging out of larvæ in this section was vigorously pursued and the numbers indicated by the census tests were found to be accurate.

Before the outset of the emergence of the adult insects, a meeting was held by the Director of Agriculture at Mon Plaisir under the presidency of the Hon. E. Sauzier, K.C., Member of Council of Government for Pamplemousses.

This meeting was attended by the proprietors and managers of the sugar estates situated within the infected area and the following agreements were made :—

(1). That the estates would pay a monthly contribution of Rs. 100 for the employment of a special gang whose duty would consist of catching insects in the fields after the public have left them.

A gang of thirty men was employed under the supervision of a special employé and succeeded in destroying up to the end of December 621,091 insects.

(2). That estates should also employ special gangs.

The gangs have captured 452,351 insects.

(3). It was also agreed to cut lines through the waste lands overgrown with indigo, "herbe condé" and other shrubs in order to facilitate the capture of the beetles. Tall trees bordering certain fields were to be cut down and other small plants grown to attract the insects to definite spots where they would be more easily destroyed.

Most of these recommendations have in part been given effect to and the destruction of the pest has been facilitated.

(4). It was decided that beetle buyers should be selected to work under the control of this Department.

Accordingly 13 persons residing in the village were authorised to buy insects from the public. They were supplied with stamped measures and were bound to use special cases and tins for storing the insects. By this means the public was fairly treated and it was ascertained that insects were not taken to non-infected localities.

As shown in the table on page 36, 38,816,417 insects were destroyed in 1914 ; whilst in 1913, 34,122,063 were captured. In 1914, 6,694,300 larvæ were dug out from the most infected fields at Maison Blanche and Mon Rocher, giving a total number of 45,510,717 insects destroyed during that year.

The number of insects caught increases yearly and more stringent measures will have to be taken against this scourge in the near future, and infected estates will have to be called upon for further assistance in the campaign.

## *Tiphia parallela.*

Another consignment of *Tiphia parallela* was received from Barbados in August.

A certain number of adult insects was obtained therefrom, some of them have been liberated in the open fields and some others transferred to the insectaries. Up to the end of December no Phytalus larvæ were found parasited.

## EDUCATIONAL.

Five students received regular instruction in Agricultural Entomology during the year and one worked in the Laboratory.

13th. February, 1915.

D. D'EMMEREZ DE CHARMOY,

Entomologist.

*ANNEXURE IV.*

REPORT ON THE WORK OF THE

# VETERINARY SURGEON.

FOR THE YEAR 1914.

1. The Veterinary Surgeon appointed to the Department of Agriculture arrived on the 30th. of October, 1914.

## *Importation of Animals.*

2. Inspection of imports of animals were made upon nine occasions from November 1st. to the end of the year. The fees paid into the Customs for imports of animals amounted to Rs. 316.

## *Inspection of Government Animals.*

3. Visits of inspection are made weekly to the animals of the Police, Medical and Health, Poor Law and Agricultural Departments.

For the Police Department, a postmortem of a horse which died suddenly of congestion was made. A second horse affected with Laminitis died of Pyrhemia and a third was wounded severely and treatment was applied.

The animals of the Medical and Health Department were all in good health except one of the donkeys which was aged and was condemned.

For the Immigration and Poor Law Department one donkey was cured of acute Laminitis.

The control of the bulls and sheep of the Agricultural Department has been attended to and no losses occurred up to the end of the year.

## *Treatment of Surra.*

4. The following animals were under treatment for surra :—

| Horses. | Mules. | Donkeys. | Dogs. |
|---|---|---|---|
| 2 ... | 1 ... | 2 ... | 3 |

One of the horses died after the fifth recidivision. One donkey died after treatment by Laveran's method. The control of surra on two animals affected in country districts gave negative results and the animals were released from quarantine.

## *Abattoir, Rose-Hill.*

5. Meat inspection was made upon every day except Thursdays. The following seizures have been ordered :—

| Bullocks. | Cows. | Pigs. |
|---|---|---|
| 5 ... | 2 ... | 2 |

These carcases were seized for abscesses, bruising, fever and tuberculosis.

F. E. LIONNET,

20th. February, 1915.

Government Veterinary Surgeon.

*ANNEXURE V.*

REPORT ON THE WORK OF THE

# STATISTICIAN

FOR THE YEAR 1914.

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The following statistical documents were prepared during the year :—

April,—Statement of Crop Prospects, 1914.
May,—Agricultural Statistics for Blue Book.
June,—Final Statement, 1913-14 Sugar-crop.
August—Average Sale Prices and Consumption of Sugar.
December—Final Estimate of 1914-15 Crop.
Live Stock Statistics, 1914.—Department of Agriculture, Statistical Series, Bulletin No. 1.

## *Land Tenure.*

The data about cane cultivation were more fully detailed during this year and information obtained respecting the acreage of cane grown by Indian planters under the different modes of land occupation existing in this Colony.

There were, at the end of 1913, 153,417 arpents under cane cultivation. Out of the 54,888 arpents of cane grown by Indians (35·77 o/o of the whole area), the following distributions are shown :—

| | |
|---|---|
| 4,298 | — on sugar estates on lands belonging to Indians. |
| 7,242 | — on estate-morcellements in course of liberation. |
| 12,288 | — on estate land held on lease or otherwise, but belonging to estates. |
| 23,828 | — Total on Sugar-estates. |
| 31,060 | — off sugar-estates. |
| 54,888 | Arpents. |

It is seen from these figures that 64.4 o/o of the land on which Indians grow cane are freehold, while 22.4 o/o are on lease and 13.2 o/o are in estate-morcellements in course of liberation.

## *Animals.*

A careful census of live stock was made at the beginning of the year, with the co-operation of the sanitary authorities. The results of that census have been analysed in Bulletin No. 1, Statistical Series, which contains also information respecting milk, meat and egg production and consumption in this Colony. The total market value of the live stock in the Colony is estimated at a minimum of Rs. 5,000,000.

## *Trams.*

According to information gathered by this Division, the cost of the estate tram lines has averaged Rs. 4,575 per kilometre, purchase price ; and Rs. 6,442, if cost of laying, construction of bridges, &c., is added.

There are 1,404 kilometres of trams existing upon the estates and this represents a cost of Rs. 6,425,000 purchase price, or about Rs. 9,050,000 if expenses of making tracks, laying of lines, &c., are included.

## *Foodstuffs for Stock.*

A large amount of money is spent annually upon foodstuffs for stock and thi

Division is collecting data upon this subject. According to information already gathered, the consumption of acacia (*Lucæna glauca*) seeds on estates seems to approximate T. 1,500 annually. The average prices for this product upon estates ranged, during 1914, from Rs. 60 to Rs. 95 per ton, according to districts. The general average value was Rs. 87.53. This represents an expenditure of more than Rs. 130,000 a year for acacia seeds, out of which barely half goes into the pockets of the gatherers.

Manioc consumption upon estates appears to be about 6,000 tons a year. Prices ranged in 1914 on estates from Rs. 16 to Rs. 35 per ton according to districts, while the average value was Rs. 22.68. About Rs. 136,000 is therefore expended annually upon manioc for cattle upon estates.

Maize consumption by animals upon estates is below 1,000 tons. Two districts only, Savanne and Grand Port, give an annual consumption of more than 200 tons each. Prices ranged, in 1914, from Rs. 50 to Rs. 95 per ton, with a general average of Rs 77.70.

## *Implemental Tillage.*

Data concerning the acreage on which implements are used in the cultivation of sugar-cane have been collected. At the beginning of 1914, implements were used on about 18,600 arpents of cane cultivation against 10,700, two years previously, and 4,075 arpents in 1909. The use of the agricultural fork is spreading rapidly, being preferred, on certain estates, to the plough.

## *Sugar-crop.*

The total sugar-crop of 1913-14 was T. 249,703, while that of 1914-15 is estimated at over T. 277,000. This is by far the largest crop the Colony has ever made.

The following table gives the average yearly sugar production of the Colony during the last four quinquennial periods :—

| | | | |
|---|---|---|---|
| 1895–99 | ... | ... | T. 156,774 |
| 1900–04 | ... | ... | T. 172,838 |
| 1905–09 | ... | ... | T. 204,734 |
| 1910–14 | ... | ... | T. 226,226 |

The total sugar production of the Colony during the last ten years has been T. 2,154,800, against T. 1,648,000 in the preceding decade. The last three crops give a total of T. 738,750 sugar. The best three consecutive years previous to that were, 1908–10, with T. 670,730.

Assuming a general average of Rs. 11.25 per 50 kilos for the crop of 1914, a total receipt of Rs. 62,000,000 would be arrived at, against Rs. 34,700,000 for the previous crop, and Rs. 29,800,000 for the 1912–13 crop.

This increase of monetary value of nearly Rs. 28,000,000 over the previous year has been due to the large crop and the extraordinarily high prices realised by reason of the European war. The total receipts for the 1908–10 crops was Rs. 103,861,000, while the total receipts for the 1912-14 crops will be Rs. 126,500,000. The average sale price for 1908–10 was Rs. 7.74 per 50 kilos, and for 1912-14 will approximate Rs. 8.56 on account of the high prices realised for the last crop.

HENRI ROBERT,

Statistician.

6th. February, 1915.

*ANNEXURE VI.*

REPORTS OF THE DIVISION OF

# EXPERIMENT STATIONS

1914.

## CENTRAL EXPERIMENT STATION, RÉDUIT.

The re-arrangement of experimental plots and the preparation of lands for implemental tillage have been continued and a cattle pasture of 10 acres has been opened up and partly planted.

The expenditure and receipts of this Station have been as follows for the year :—

### *Expenditure.*

| | Rs. c. |
|---|---|
| 1. Wages of Labourers ... ... ... ... | 5,388.85 |
| 2. Purchase of Fertilisers ... ... ... ... | 1,100.35 |
| 3. „ „ Tools, Harness, &c., ... ... ... | 143.84 |
| 4. „ „ Baskets and Pots for cane seedlings ... ... | 101.10 |
| 5. Erection of Houses for Stock and Poultry... ... ... | 3,247.62 |
| 6. Purchase of Stock ... ... ... ... ... | 3,792.20 |
| 7. Purchase of Food for Stock ... ... ... ... | 134.22 |
| 8. Clearing Land ... ... ... ... ... | 291.45 |
| 9. Introduction of Canes and Economics ... ... ... | 397.58 |
| 10. Improvements to Camp and Peons' Quarters ... ... | 677.36 |
| 11. Miscellaneous ... ... ... ... ... | 1,205.74 |
| Total... Rs. | 16,480.31 |

### *Receipts.*

| | Rs. c. |
|---|---|
| Sale of Canes ... ... ... ... | 3,345.10 |
| „ „ Seeds ... ... ... ... | 81.61 |
| „ „ Eggs ... ... ... ... | 242.00 |
| Total... Rs. | 3,668.71 |

## SUGAR-CANE EXPERIMENTS.

### *Crop.*

The cane crop extended from September 10 to 19 and November 3 to 23. An area of approximately 11½ arpents was cut and a yield of 334 tons 510 kilos was obtained.

The canes were sent to Mon Désert Estate, St. Pierre, for crushing on the basis of 60 o/o of the extraction of the mill. The cost of cartage and loading was Rs. 295.40. Tops of selected varieties were distributed to 40 estates and planters ; in April, to Pamplemousses, Rivière du Rempart and Black River districts, and in December, to other districts.

### *Introduction of new Varieties.*

Varieties of canes were introduced from Java, Louisiana, Fiji, Mexico, India, Egypt, Formosa, Philippines, Argentine, Trinidad, Barbados and the Straits Settlements.

There are at present growing in the Nursery the following varieties introduced during the year :—

| | | | | | |
|---|---|---|---|---|---|
| B. 88 ... | 1 hole | B. F. ... | 102 holes | B. F. ... | 314 holes |
| B. 376 ... | 4 holes | P.O.J. 100 ... | 12 „ | Common Negro purple | 3 „ |
| B. 208 ... | 1 hole | „ 139 ... | 4 „ | Laguna white ... | 1 hole |
| B. 306 ... | 3 holes | „ 161 ... | 7 „ | Red Mauritius ... | 7 holes |
| B. 3922 ... | 16 „ | „ 188 ... | 7 „ | White Mauritius ... | 2 „ |
| B. 4596 ... | 2 „ | „ 213 ... | 14 „ | Buxaria ... | 2 „ |
| B. 4934 ... | 12 „ | „ 228 ... | 2 „ | Shamsara ... | 3 „ |
| B. 6450 ... | 6 „ | „ 826 ... | 7 „ | Dhalsundar ... | 2 „ |
| B. 6308 ... | 12 „ | Badilla ... | 72 „ | Java ... ... | 2 „ |
| D. 95 ... | 6 „ | White Transparent | 14 „ | Sealy's Seedling ... | 2 „ |
| D. 109 ... | 3 „ | Roumi Ahmar (Egypt) | 6 „ | Mauritius Guingham | 14 „ |
| D. 117 ... | 13 „ | Indian Cane ... | 26 „ | Sui nombre, 54 thin | 2 „ |
| D. 145 ... | 2 „ | Rose Bambou ... | 5 „ | Honduras thick ... | 2 „ |
| D. 1135 ... | 7 „ | Shakar Chynia ... | 1 hole | Morada rayada de Jujuy ... | 1 hole |
| T. 39 ... | 4 „ | Striped Bansa .. | 3 holes | Morada ... | 1 „ |
| T. 75 .. | 3 „ | Yellow Caledonia | 13 „ | Rayada de Jujuy | 1 „ |
| P.O.J.36 ... | 7 „ | Black Manilla ... | 12 „ | Cane ex Singapore | 2 holes |
| C. O. ... | 102 holes | Black Cheribon | 7 „ | Total ... | 361 holes |
| | | C. O. ... | 314 holes | | |

The shipment of cane cuttings in charcoal by parcel post has been demonstrated as being a reliable means of sending varieties from one part of the world to another.

### *Seedlings.*

The Réduit sowings of cane arrows gave the following results :—

| Parent Cane. | No. of Seedlings. |
|---|---|
| Uba or China ... ... ... | 5 |
| Fotiogo ... ... ... ... | 6 |
| White Tanna ... ... ... | 13 |
| Striped Tanna ... ... ... | 3 |
| St. Aubin Seedling ... ... | 1 |
| No. 55 P. ... ... ... | 537 |
| No. 87 P. ... ... .. | 643 |
| No. 131 P. ... ... ... | 5 |
| D. 74 ... ... ... | 280 |
| Total ... | 1,493 |

## EXPERIMENTS WITH ECONOMICS OTHER THAN SUGAR-CANE.

### *Ground-nuts.*

Twelve varieties were submitted to varietal tests at Réduit. The results were as follows :—

Larger plots—1/33 arpent.

| | *Habit of growth.* | *Average yield per arpent. kilos.* |
|---|---|---|
| 1. Local ... | running ... | 2435 ± 672 |
| 2. Virginie ... | erect ... | 2356 ± 293 |
| 3. Bunch ... | „ ... | 2015 ± 213.7 |
| 4. Virginia Bunch | „ ... | 1845 ± 387 |
| 5. Spanish ... | „ ... | 1407 ± 344 |
| 6. Tennessee ... | „ ... | 1320 ± 77 |
| 7. Spanish (new) | ... ... | 948 ± 78 |

Smaller Plots—1/67 arpent.

| | | |
|---|---|---|
| 1. Gambia ... | running ... | 1783 ± 162 |
| 2. Refusque ... | „ ... | 1448 ± 322 |
| 3. Local ... ... | „ ... | 1178 ± 105 |
| 4. Virginia running | „ ... | 1110 ± 135 |
| 5. Zuivere lyn No. 21 | „ ... | 1363 (local 2859 ± 320) |
| 6. Holle Tjikennenh | „ ... | 1261 „ „ |

Seeds of the most promising were offered for sale and 236 kilos were sold.

## *Maize.*

Trials of new varieties received from the United States, Egypt, Java and Rhodesia were made in two fields, against local varieties.

The heaviest crops from imported varieties were given by the "Hickory King", " Marlboro Prolific " and " Salisbury " kinds.

189½ kilos of seeds of these varieties were sold to planters and 72 kilos distributed to Government Institutions.

## *Manioc.*

23 different kinds of manioc were planted in December for experimental testing.

## *Coffea robusta.*

234 Seedlings of *Coffea robusta* plants were sold or distributed during the year.
24 Plants were sent to Rodrigues for trial in that dependency.

# STOCK.

## *Cattle.*

Three bulls were received from Madagascar on August 14. These bulls were kept at Réduit until the end of the year in order to acclimatize. They have been introduced for loan to cattle breeders, and others are expected from India.

## *Sheep.*

Six rams and eleven ewes were received from Nigeria, West Africa, on December 14. One lamb was born *en route* and another shortly after arrival. The animals were obtained from around Zaria, Northern Nigeria, but one ram is of the Bornu type.

## *Poultry.*

Five pens, each of 1 cock and 6 hens, of pedigree fowls were introduced during the year. The results have been as follows :—

| | *Date record.* | *Eggs laid to December 31.* | *Average per hen per month.* |
|---|---|---|---|
| 1. White Leghorns (Australia) ... | 7.9.14 | 195 | 11.1 |
| 2. Plymouth Rocks (South Africa) | 28.5.14 | 392 | 10.9 |
| 3. Black Orpingtons (Australia) | 7.9.14 | 215 | 10.3 |
| 4. Buff Orpingtons (England) ... | 20.6.14 | 206 | 8.1 |
| 5. Black Minorcas (South Africa) | 28.5.14 | 205 | 5.7 |

Two adult Buff Orpingtons died shortly after receipt and losses were experienced in December amongst young birds through a kidney disease and chicken-pox.

Up to December 31st. a total of 968 eggs were sold to the public at the rate of Rs. 3 per dozen. There is a very good demand for eggs, and young birds will shortly be available for sale.

The Poultry Stock Account to December 31st. is as follows :—

| *Expenditure.* | Rs. c. | *Receipts.* | Rs. c. |
|---|---|---|---|
| Cost of erection of Buildings ... ... | 1,131.68 | Valuation of Buildings, December 31 ... | 1,075.10 |
| Purchase of Stock ... | 579.15 | Sale of Eggs ... ... | 242.00 |
| Upkeep of Stock (from May) ... | 111.76 | Valuation of Stock : Adults ... | 502.16 |
| By Profit ... ... | 261.67 | Young ... | 265.00 |
| Total ... | 2,084.26 | Total ... | 2,084.26 |

## EXPERIMENTAL PLOTS UPON ESTATES.

Experiments to ascertain the manurial requirements of sugar-cane and to test the effects of applications of molasses and lime have been begun in co-operation with the following estates :—

Beau Champ, Terracine, Sans Souci, Alma, Riche-en-Eau, Mon Désert (Carié), Britannia, Bagatelle, Antoinette, Mon Songe, and Belle Rive.

*Beau Champ*—This experimental field is divided into 52 plots of $\frac{1}{20}$ arpent each. It was planted in 1913 and the different fertilizers applied on January 15, 1914. The virgin crop was reaped from September 1–4, and results recorded. The ratoons on this plot were manured on October 23.

*Terracine*—Area of field 3 arpents, consisting of 23 plots. Manuring was done on May 20.

*Sans Souci*—This experimental field is 3 arpents in extent comprising 21 plots. Manurings were done on February 24 and July 6.

*Alma*—The land selected for manurial experiments is $3\frac{1}{5}$ arpents and is marked out into 18 plots. 'Petit guanage' was done on March 16 and 'grand guanage' on June 18.

*Riche-en-Eau*—Field of 4 arpents consisting of 26 plots. 'Petit guanage' was done on March 31 and 'grand guanage' on May 27.

*Mon Désert* (C)—Area of field : $2\frac{1}{13}$ arpents, divided into 27 plots. The first application of manures was made on April 29, and the second on August 18.

*Britannia*—The land selected upon this estate has an area of $6\frac{1}{10}$ arpents subdivided into 72 plots ; the fertilizers were applied as follows :—

1st. portion on April 2nd.
2nd. „ „ July 1st.
3rd. „ „ December 11th.

*Bagatelle*—A field of $4\frac{3}{4}$ arpents was marked out into 24 plots. The fertilizers were applied on April 24, June 17, and December 23.

*Antoinette*—Area of field : $1\frac{1}{4}$ arpent. Number of plots : 21. The canes were manured on June 30.

*Mon Songe*—This experimental field has an extent of $1\frac{1}{4}$ arpent ; it has been divided into 20 equal plots. Manures were applied on July 1st.

*Belle Rive*—25 plots making a total area of $5\frac{3}{4}$ arpents were marked out on October 28 and the fertilizers were applied on the following day.

## DEMONSTRATION PLOTS.

Demonstration plots for small planters were started during the year at Petit Raffray, Triolet and Long Mountain.

*Triolet*—About $\frac{1}{2}$ arpent was selected near the Triolet Temple. It was marked out into 3 plots and planted with tops of canes 33, 87 and D.130.

Owing to the severe drought in this district, the plantation failed and replanting was done later in the year.

*Petit Raffray*—One arpent was leased and divided into three plots, and planted with canes 33, D.130 and D.625.

This plantation had the advantage of some light showers of rain at a time of planting. The tops grew well and little recruiting had to be done.

*Montagne Longue*—$2\frac{1}{10}$ arpents were marked out on December 10 ; the land is now being prepared for planting.

## SUPERVISION OF PAMPLEMOUSSES & CUREPIPE EXPERIMENT STATIONS & GARDENS.

*Pamplemousses* :

Varietal experiments were conducted at Pamplemousses with sugar-canes, maize, ground-nuts, yams, manioc, rice, tobacco, sweet potatos and cotton. The results of these experiments are given by the Overseer of this Station. Cuttings of econo-

mics and seeds at this Station have been distributed free to planters and Government Institutions. 4,412 cane seedlings were raised.

| Parent. | No. of seedlings. | Parent. | No. of seedlings. |
|---|---|---|---|
| 55 P. ... | 1,593 | B.F. ... | 4,291 |
| 87 P. ... | 1,101 | White Tanna ... | 80 |
| 133 P. ... | 36 | Striped „ ... | 2 |
| 131 P. ... | 553 | Black „ ... | 4 |
| 33 P. ... | 376 | Fotiogo ... | 19 |
| D. 130 ... | 525 | Goru ... | 2 |
| D. 74 ... | 107 | St. Aubin seedling | 14 |
| C.O. ... | 4,291 | Total ... | 4,412 |

The experimental cultivations were successful except cotton which gave most unsatisfactory results.

*Curepipe*—A School Garden section has been created for Elementary Schools at this Station and different varieties of economic plants such as bananas, canes, manioc, sweet potatos, pine apples, pistache and vegetables are grown.

An Educational Section is also being established for the Royal College at that station; plants of the same botanical order are being grouped together, so that students will be able to obtain an elementary knowledge of the principal orders of plants.

The experimental cultivations of camphor and tea have made progress during the year.

C. A. O'CONNOR,
Chief Overseer.

6th. February, 1915.

## PAMPLEMOUSSES GARDENS
AND
## EXPERIMENT STATION.

### *Expenditure & Receipts.*

The following expenditure was incurred during the year :—

| | Rs. c. |
|---|---|
| Salaries ... ... ... ... ... | 2,116.21 |
| Maintenance of Apprentices ... ... ... | 382.37 |
| Economic Wages .. ... ... ... | 3,258.49 |
| Ornamental Wages ... ... ... ... | 5,214.64 |
| Supplies and Miscellaneous... ... ... ... | 1,122.96 |
| Total... Rs. | 12,094.67 |

The receipts were as follows :—

| | Rs. c. |
|---|---|
| Canes ... ... ... ... ... | 490.93 |
| Economic Plants, Flowers, &c., ... ... ... | 122.80 |
| Seeds ... ... ... ... ... | 10.60 |
| Total... Rs. | 624.33 |

## EXPERIMENT STATION.

The 1,142 seedlings raised in 1913 were planted out in December 1913 and were cut on November 30th., 1914. A careful record has been kept of all varieties and complete notes made respecting the self-fertilised ones. The best seedlings were selected by the Director and tops sent for propagation at Réduit as follows :—

| Parent. | No. of Canes selected. | Percentage. |
|---|---|---|
| D 74 | 73 | 17.7 |
| Tamarin | 41 | 26.6 |
| P 131 | 34 | 14.7 |
| P 55 | 9 | 19.1 |
| D 130 | 6 | 27.1 |
| Fotiogo | 6 | 33.3 |
| P 87 | 3 | 10.0 |
| Mixed | 28 | 15.4 |

Ratoons of all seedlings are being grown at Pamplemousses.

A new plantation with selected varieties of cane seedlings from Réduit was made in April 1914. These canes were partly irrigated, but suffered considerably during the dry months of September to December.

The general cane crop was made in September 1914. A total crop of 37,040 kilos was obtained and this was sold to Beau Plan sugar estate at the rate of Rs. 11.50 per ton. 1,082 tops of selected varieties were supplied to Mon Rocher Estate.

The results of seed sowings in 1914 were satisfactory and the following were selected for planting out of a total of 4,398 :—

| Parent. | No. of seedling. | Parent. | No. of seedlings. |
|---|---|---|---|
| | | B.F. ... | 2,263 |
| D 130 (selfed) ... | 264 | D. 130 ... | 315 |
| 33 (selfed) ... | 17 | 33 ... | 272 |
| P. 55 ... | 1,061 | D. 74 ... | 96 |
| P. 131 ... | 513 | White Tanna ... | 56 |
| P. 87 ... | 408 | Miscellaneous ... | 68 |
| C.O. ... | 2,263 | Total ... | 3,070 |

### *Ground-Nuts.*

Six varieties of ground-nuts were under experimental trial during the year. Their results were as follows :—

| Variety. | Habit of Growth. | Yield kilos per arpent. |
|---|---|---|
| 1. Virginie... ... | erect ... ... ... | ... 1,803 ± 137 |
| 2. Bunch ... ... | „ ... ... ... | ... 1,428 ± 152 |
| 3. Local ... ... | running ... ... ... | ... 1,222 ± 167 |
| 4. Spanish ... ... | erect ... ... ... | ... 1,050 ± 174 |
| 5. Tennessee ... | „ ... ... ... | ... 868 ± 143 |
| 6. Spanish (new) ... | „ ... ... ... | ... 520 ± 161 |

Seeds of the first two varieties were sold for cultivation by small planters.

### *Maize.*

Nine varieties of maize were tested during the year and seeds of the better kinds were subsequently distributed. The yields of the various varieties were as follows :—

| Variety. | Area of Plots. | Yield of Cobs per arpent. K. | Yield of maize per arpent. K. |
|---|---|---|---|
| Marlboro prolific ... | 1/33 arp : ... | 3,631 ± 113 ... | 2,539 ± 79 |
| Local (yellow) ... | „ ... | 3,825 ± 750 ... | 2,157 ± 420 |
| Hickory King (Rhodesia) | „ ... | 2,502 ± 475 ... | 1,881 ± 356 |
| Do. do. (America) | „ ... | 2,194 ... | 1,505 |
| Salisbury ... ... ... | 1/67 arp : ... | 2,301 ± 425 ... | 1,818 ± 335 |
| Brazos ... ... | „ ... | 2,493 ... | 1,317 |
| Gele menado ... ... | „ ... | 2,489 ... | 1,066 ± 116 |
| Witte menado ... | „ ... | 690 ... | — |
| Madoera ... ... | „ ... | 577 ± 100 ... | 282 ± 42 |

## *Rice.*

The results of the rice experiments were as follows :—

| | Yield of Paddy per arpent. kilos. |
|---|---|
| Mudu kiriel (Ceylon) Bearded ... | 1,211.3 ± 145.8 |
| Rangaibe (Madagascar) ... | 1,044.5 ± 183.6 |
| Sudu Elwi (Ceylon) ... ... | 867 ± 173.4 |
| Mahatson (Riz de montagne Madagascar) | 797.2 ± 83.0 |
| Lua Thoni (Ceylon) ... ... | 693 |
| Kalu (Ceylon) ... ... | 608 |

The above varieties were cultivated in triplicate upon plots of 1/88 arpent each and 10 varieties of British Guiana varieties were experimented with upon smaller areas.

## *Manioc.*

The manioc variety tests have given the following results :—

| Variety. | Yield tons per arpent. | Variety. | Yield tons per arpent. |
|---|---|---|---|
| Federated Malay States ... | 13.6 | Cabesa-dura ... ... ... | 5.9 |
| Trinidad 1... ... ... ... | 10.1 | Trinidad No. 2 ... ... ... | 5.1 |
| Jachroe ... ... ... ... | 8.3 | Pacho... ... ... ... ... | 5.1 |
| Australie (local)... ... ... | 8.2 | Trinidad No. 3 ... ... ... | 4.6 |
| Negrita 12... ... ... ... | 7.8 | Small leaf ... ... ... ... | 4.2 |
| Pacho 3 ... ... ... ... | 7.6 | Paloma ... ... ... ... | 3.9 |
| Negrita 11... ... ... . . | 7.5 | Negrita 17... ... ... ... | 3.2 |
| Constantine (local) ... ... | 6.7 | Singapore (local) ... ... | 3.1 |
| Icery (local) ... ... ... | 6.4 | Blancite ... ... ... ... | 2.3 |

Other varieties not yet reaped are Blue Top, White Greenaway, Red Greenaway and Helada.

Cuttings of 7 of the above varieties were distributed to 10 estates for estate trial.

There are also under cultivation 23 other varieties received from Antigua, Trinidad, Barbados and Java during the year. These are in vigorous growth and some present a very promising appearance.

## *Sweet Potatos.*

The results of varietal tests with local kinds of sweet potatos have been as follows :—

| | Tons per arpent. | | Tons per arpent. |
|---|---|---|---|
| Violet ... ... ... ... | 14.5 | Red ... ... ... ... | 8.7 |
| Gandia ... ... ... ... | 13.7 | Yellow ... ... ... ... | 8.0 |
| Raisin ... ... ... ... | 8.8 | Blanche ... ... ... — | 6.8 |

The plots with introduced kinds yielded as follows :—

| | Tons per arpent. | | Tons per arpent. |
|---|---|---|---|
| Pierson ... ... ... ... | 5.9 | Shanghai ... ... ... ... | 4.7 |
| Big Stain Jersey... ... ... | 5.8 | Pumpkin Jam ... ... ... | 2.4 |
| Red Bermuda ... ... ... | 5.5 | Florida ... ... ... ... | 1.1 |
| Southern Queen ... ... ... | 5.1 | | |

Other varieties under cultivation are :—

Georgia Jam, Jersey, Red Jersey, Black Spanish, Turkey Claw, Joes, Sealy, Iskandatain, Egyptian White, Egyptian Red and Bebar.

## *Yams.*

The following varieties of yams have been introduced and are now under cultivation :—

Bottleneck Lisbon, Lisbon, Horne, Oriental, Sealed Top, Danish Cush-cush, Light Red, Crop, Bugle Horn, Yam Tuque.

## *Cotton.*

Experiments were made with 5 varieties of cotton received from the Union Department of Agriculture, South Africa, and with 4 varieties of Egyptian cotton imported through the Ministry of Agriculture, Egypt. The plants grew satisfactorily, but few bolls were produced and the yields of lint very small. *Tortrix insulana* caused considerable damage to bolls.

## *Tobacco.*

Twenty five varieties of ordinary strains of tobacco were grown on small areas. These were cured after the Cuban methods for the production of cigar leaf tobacco. Some difficulties were experienced in curing, but some fairly good tobacco was obtained. Comstock Spanish, White Burley and Worne varieties gave good yields of leaf. Three varieties of Turkish tobacco were experimented with. The growth of this class of tobacco promises to be satisfactory, and extended experiments have been planned for the coming year.

## *Other Economics.*

Experiments have also been made with broom corn and with pistache Malgache (Voandzia). A plot has been planted with different varieties of bananas, another with coffee robusta while the collection of grafted mangos is being overhauled and improved.

## ORNAMENTAL SECTION—GARDENS.

A considerable number of plants of ornamentals have been raised in the nursery and the borders are being systematically overhauled and replanted. Many of the borders had become overgrown and in some the plants required renewal. Five borders were entirely replanted during the year.

The new pattern of label (showing the vernacular and scientific names of the plants, and giving a short description of its habitat and uses) has proved to be attractive. These labels are all being prepared locally and the work of labelling the principal trees in the gardens is being pushed on as rapidly as possible.

Two kiosks were repaired during the year, while the large kiosk on the islet in the large lake was pulled down and remodelled.

The roads and canals have been kept in good order during the year. Some changes are being made in the road systems with a view to opening up certain of them to motor and wheeled traffic at an early date.

## *Herbarium.*

No additions were made to the herbarium during the year; but the regular work of upkeep was attended to.

## *Buildings.*

These were all attended to during the year by the Public Works Department, extensive repairs being done to Mon Plaisir House, to the quarters of the Overseer and Guardian, and to the buildings occupied by the Garden employees.

## *Foreign Exchanges of Plants & Seeds.*

Plants and seeds were received from :— Dominica, Ceylon, British Guiana, Egypt, Java, Singapore, French Guinea, Union of South Africa, Philippines, Federated Malay States, Belgian Congo, Antigua, Trinidad and Jamaica.

Supplies of seeds, &c., were sent to :—Mysore, United States, Singapore, New Delhi, British Guiana, Port Darwin and Natal.

## *Picnics and Visitors.*

252 Picnics were held during the year and there were 31,089 visitors to the Gardens.

## *Rainfall.*

The rainfall during the year was 41.41 inches.

L, M. LECLERC,

15th. February, 1915. Overseer.

# LE RÉDUIT GROUNDS.

## *Expenditure.*

The amount spent for the upkeep of the grounds, flower-gardens, kitchen-gardens and other miscellaneous works connected with Government House, Le Réduit, has been as follows :—

| | | |
|---|---|---|
| 1. Salary of Overseer ... ... ... ... | Rs. | 780.00 |
| 2. Wages of Sirdar and Labourers ... ... | | 4,052.05 |
| 3. Salaries of Prison Warders ... ... ... | | 307.00 |
| 4. Petty supplies... ... ... ... ... | | 391.68 |
| | Rs. | 5,530.73 |

## *General Work.*

The general routine has been carried out as usual and some alteration and improvements in the grounds made. The main entrance has been improved and enlarged, some tennis-lawns relevelled and replanted with lawn grass. The shrubbery beds near the flagstaff have been removed and replaced by grass. Special ornamentals were grown for the verandahs of Government House. The collection of all manure into a special heap, enclosed in dry stone walls opposite the kitchen-garden, tends to improve the sanitary condition of the stables and cow-sheds and facilitates control. The organisation of special pits for leaf mould is also receiving attention. A small nursery for propagating ornamental plants for verandah decoration has been created near the tool-shed and cuttings of crotons and other ornamental plants have been made and seeds of palm sown. About 1½ acres of land near the lower camp were cleared from undergrowth and planted with palmiste (*Acantophœnix rubra*). Near the "Bout du Monde", further quantities of palms were planted for trial. In all, 1,540 plants were put out. Those planted on "Bout du Monde" suffered very severely during the excessive dry weather at the close of the year.

## *Ylang-ylang.*

59 Kilos of flowers of ylang-ylang were collected during the months of March, April and May and sent to Cressonville distillery for distilling purposes. A yield of .82 o/o essence was obtained.

## *Ponds and Canals.*

During the drought of November and December, the ponds in the French garden dried up and advantage was taken of this opportunity to have them thoroughly cleaned.

## *Phytalus.*

The area infected with Phytalus was tilled by prison labour during the months of June to August and 517 larvæ collected. 94 adults were captured during the year. The control of this pest at Réduit appears to be effective.

## *Rainfall.*

The rainfall recorded at Le Réduit during 1914 was 37.95 ins. The months of October to December were very dry and the Grounds suffered considerably from shortage of water.

25th. January, 1915.

F. MARGUÉRITTE,

Overseer.

## CUREPIPE GARDENS.

### *Expenditure.*

The expenditure in these gardens has been as follows :—

| | |
|---|---|
| Salary of Overseer ... ... ... ... ... | Rs. 600.00 |
| Wages ... ... ... ... ... ... | 2,776.69 |
| Supplies ... ... ... .. ... ... | 796.86 |
| | Rs. 4,173.55 |

The receipts were as follows :—

| | |
|---|---|
| Economic Plants ... ... ... ... ... | Rs. 5.00 |
| Ornamental Plants ... ... ... ... ... | 66.96 |
| Cut Flowers ... ... ... ... ... ... | 92.45 |
| Miscellaneous ... ... ... ... ... | 5.75 |
| | Rs. 170.16 |

### *Economics.*

Plots have been prepared for the cultivation of economic crops. Varietal tests of pine apples have already been laid out and bananas will shortly be put in. The tea plantation has received attention during the year and is now in a good state. The young plants are growing satisfactorily. The young camphor plantation is progressing satisfactorily. The raising of coffee plants for sale has received attention.

### *Ornamentals.*

The upper portion of the Gardens has been properly cleared, the shrubs on beds pruned and the soil forked. A new plot has been planted with camelias near the spring. The annuals flowered well during the year and the asters were much admired by the public. The rose borders received close attention and flowered well.

A new nursery has been created and beds prepared for plants and cuttings of ornamental plants in pots are also being prepared.

### *Roads & Buildings.*

Great improvements have been made during the year. The store and stables have been rebuilt.

In the upper part of the gardens, close to the Forests Division (Pinetum) a new road has been opened up. The main roads have been recovered with fresh macadam and have been improved.

The Overseer's quarters were replaced by a new building as the old building was in bad state of repair.

One kiosk was re-covered with thatch during the year.

### *Educational.*

An educational section and a model school garden section have been established. The school garden section is intended for use in lectures to elementary school-masters and to serve as a model to them. The educational section is being established for use in connection with the Royal College. The latter consists of groups of the commoner plants of the Colony grouped into their respective orders. The first division, namely : monocotyledons, has been planted, and the others will shortly be planted out.

### *Rainfall.*

The rainfall for the year was 80.73 inches. The wettest month was June, when 14.68 ins. were registered.

6th. February, 1915.

F. LECLERC,

Overseer.

*ANNEXURE VII.*

## REPORT OF BOARD OF AGRICULTURE FOR 1914.

The Board of Agriculture, established under Article 4 of Ordinance No. 30 of 1912, consists of :—

His Excellency the Governor, President,
The Director of Agriculture, Vice-President,
and eighteen members appointed by His Excellency the Governor.

The following members were appointed under Notification No. 4 of January 10th., 1914, for the year 1914 :—

| | |
|---|---|
| The Hon. H. Leclézio, C.M.G. | H. G. Ducray, Esq. |
| „ G. Antelme. | W. P. Ebbels, Esq. |
| „ J. A. Duclos. | Gustave Guimbeau, Esq. |
| „ M. Martin. | Amédée Hugnin, Esq. |
| Pierre Adam, Esq. | T. W. Innes, Esq. |
| Ed. Carcenac, Esq. | F. N. Langlois, Esq. |
| Art. Dalais, Esq. | Gabriel Régnard, Esq. |
| L. H. de Froberville, Esq. | Adrien Wiehé, Esq. |
| W. E. Desplace, Esq. | Pundit Bolaram Mookteram. |

Meetings of this Board were held on July 22nd. and on December 30th., 1914.

*July Meeting.* At the July Meeting, presided over by His Honour the Office. Administering the Government, the following reports were laid before the Board :—

(1) Administration Report of Department of Agriculture, 1913.
(2) Report of Entomologist's Visit to South Africa.
(3) Bulletins 1 and 2 of General Series.
(4) Report of Investigations of Pests and Diseases of Plants.
(5) Phytalus Smithi Destruction Return to May, 1914.
(6) Final Statement of Sugar-crop, 1913–14.
(7) Agricultural Statistics.

The following matters received consideration :—

(1) Cattle Dipping.
(2) Control of Insect Pests affecting stored Grain.
(3) Coccus introduction for control of Cactus Pest.
(4) Phytalus Destruction.
(5) Vanilla Consolidation Ordinance.
(6) Destruction of Mongoose.
(7) Demonstration Plots for small planters.
(8) Experiments with Tea.
(9) Conditions of loan of Stock (Stud animals).
(10) Forage Importation.
(11) Importation of new Varieties of Sugar-cane.

At the December meeting, presided over by His Excellency the Governor, the following reports were laid before the Board :—

(1) Bulletin 3, General Series.
(2) Leaflet on Potash Salts in manuring sugar-cane.
(3) Report on Investigations made in Laboratory of Department of Agriculture, July 1st. to November 30th., 1914.
(4) Phytalus Smithi Return to November 30th., 1914.
(5) Average Sale Price and Consumption, sugar-crop 1913–14.
(6) Final Estimate of 1914–15 Crop.

The following matters received consideration :—

(1) Phytalus Destruction and Control.
(2) Vanilla Consolidation Ordinance.
(3) Live Stock—amended conditions respecting loan of.
(4) Rules covering visits of Veterinary Surgeon on Sugar Estates.
(5) Sugar-cane Experiments, 1914.
(6) Deterioration of White Tanna and other varieties of Cane.
(7) Request for Fruit and Fruit Preserves for His Majesty's Navy.

15th. February, 1915.

H. ROBERT,
Secretary.

## PHYTALUS DESTRUCTION.

STATEMENT showing number of Beetles purchased, received free, and caught by special gangs during the year 1914.

| Months, 1914. | No. of beetles received free. | | | | Number of beetles caught by special gangs. | | | | | No. of Beetles purchased. |
|---|---|---|---|---|---|---|---|---|---|---|
| | Mon Rocher. | The Mount. | Beau Plan. | Esperance. | Mon Rocher. | The Mount. | Beau Plan. | Esperance. | R.B. Gardens. | |
| January ... ... ... | ... | ... | ... | ... | 67,480 | 47,563 | 34,275 | ... | 12,925 | 3,956,600 |
| February ... ... ... | ... | ... | ... | ... | 30,310 | 34,760 | 5,160 | ... | ... | 655,120 |
| March ... ... ... | ... | ... | ... | ... | 12,635 | 20,570 | 7,910 | ... | ... | 146,160 |
| April ... ... .. | ... | ... | ... | ... | 1,530 | 2,595 | ... | ... | ... | 3,900 |
| May ... ... ... | ... | .. | ... | ... | ... | ... | ... | ... | ... | ... |
| June ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 300 |
| July ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| August ... ... ... | ... | ... | ... | ... | .. | ... | ... | ... | ... | 130 |
| September ... ... | ... | 3,950 | ... | ... | ... | ... | ... | ... | ... | 20,405 |
| October ... ... ... | 980 | 34,942 | 6,189 | 2,575 | 670 | 2,537 | 3,068 | 2,373 | .. | 284,705 |
| November ... ... | 3,650 | 61,805 | 17,074 | 4,430 | 8,377 | 10,846 | 13,288 | 13,738 | ... | 1,495,815 |
| December... ... ... | 32,950 | 217,000 | 58,276 | 8,530 | 64,387 | 69,123 | 60,497 | 63,474 | 30,900 | 31,179,940 |
| Total ... | 37,580 | 317,697 | 81,539 | 15,535 | 185,389 | 187,994 | 124,198 | 79,585 | 43,825 | 37,743,075 |

Grand Total ... 38,816,417

## PHYTALUS DESTRUCTION.

STATEMENT showing the number of Larvæ purchased and total expenditure incurred during the year 1914.

| Months, 1914. | Number of Larvæ purchased. | Total paid for Beetles. Rs. | c. | Total paid for Larvæ. Rs. | c. | Staff & Labourers. Rs. | c. | Sundries. Rs. | c. | Total Amount spent. Rs. | c. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| January ... ... | ... | 904 | 42 | ... | ... | 147 | 61 | 20 | 50 | 1,072 | 53 |
| February ... ... | ... | 327 | 56 | ... | ... | 131 | 00 | 41 | 25 | 499 | 81 |
| March ... ... | ... | 73 | 08 | ... | ... | 131 | 00 | 14 | 00 | 218 | 08 |
| April ... .. ... | ... | 2 | 10 | ... | ... | 131 | 00 | 45 | 00 | 178 | 10 |
| May ... ... ... | ... | ... | ... | ... | ... | 131 | 00 | 67 | 20 | 198 | 20 |
| June ... ... ... | 323,650 | 1 | 05 | 64 | 73 | 131 | 00 | 44 | 00 | 240 | 78 |
| July ... ... ... | 5,620,100 | ... | ... | 1,124 | 02 | 131 | 00 | 34 | 80 | 1,289 | 82 |
| August ... ... | 691,300 | ... | 26 | 138 | 26 | 133 | 00 | 16 | 20 | 287 | 72 |
| September ... ... | 54,250 | 81 | 62 | 10 | 83 | 133 | 00 | 9 | 40 | 234 | 85 |
| October ... ... | 5,000 | 724 | 83 | 1 | 00 | 108 | 00 | 6 | 15 | 839 | 98 |
| November ... ... | ... | 1,540 | 23 | ... | ... | 236 | 96 | 16 | 40 | 1,793 | 59 |
| December ... ... | ... | 7,030 | 50 | | ... | 590 | 00 | 23 | 25 | 7,643 | 75 |
| Total ... | 6,694,300 | 10,685 | 65 | 1,338 | 84 | 2,134 | 57 | 338 | 15 | 14,497 | 21 |

27th. January, 1915.

A. DELORD,

Officer in Charge.